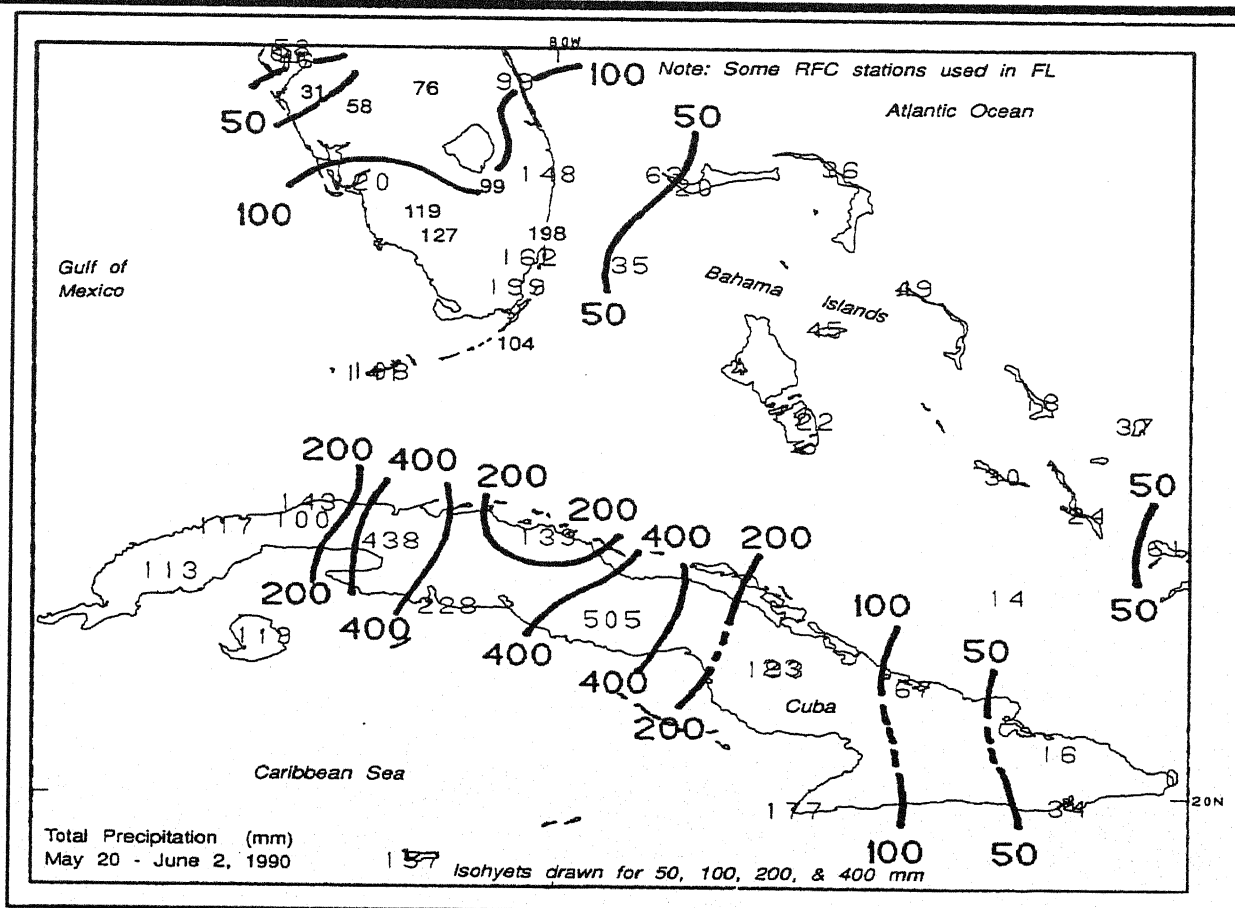


WEEKLY CLIMATE BULLETIN

No. 90/22

Washington, DC

June 2, 1990



ABUNDANT CONVECTION CONTINUED FOR THE SECOND CONSECUTIVE WEEK ACROSS MUCH OF CUBA AND SOUTHERN FLORIDA, EASING SHORT AND LONG-TERM DRYNESS IN THE LATTER AREA. IN CUBA, HOWEVER, THE COPIOUS RAINS (OVER 400 MM) FURTHER DELAYED THE COUNTRY'S SUGAR HARVEST, CAUSED WIDESPREAD PROPERTY DAMAGE, AND FORCED THE EVACUATION OF THOUSANDS OF PEOPLE AS TORRENTIAL RAINS THREATENED TO FLOOD THE ISLAND'S BIGGEST RESERVOIR (ZAZA) IN CENTRAL CUBA'S SANCTI SPIRITUS PROVINCE, ACCORDING TO PRESS REPORTS.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *U.S. cooling degree days (summer) or heating degree days (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JUNE 2, 1990

1. Central United States:

DRENCHING RAINS AND SEVERE WEATHER ABOUND.

Prolonged, heavy thunderstorms dumped large amounts of rain across much of the south-central Plains and lower Mississippi Valley once again, deluging an area from northern Texas and southwestern Oklahoma eastward into south-central Missouri with 65 mm to 175 mm of rain. Extreme amounts between 175 mm and 236 mm soaked small portions of the region from east-central Texas into northeastern and southeastern Louisiana and adjacent locations in Mississippi. In contrast, dry weather (less than 20 mm of rain) brought welcome relief from the recent inundation to an area from the central Great Plains eastward across the Corn Belt and throughout the Tennessee Valley [20 weeks]. Late Saturday, a line of intense thunderstorms barreled across the Midwest, generating the worst tornado outbreak in Indiana since 1974 and spawning more than 100 twisters throughout the middle Mississippi and western Ohio Valleys. In addition, these storms dropped between 100 mm and 150 mm of rain on much of the southern tiers of Indiana and Ohio as well as northern portions of Kentucky [Episodic Event].

2. Southern Florida and Cuba:

HEAVY TROPICAL CONVECTION PERSISTS.

Heavy showers and thunderstorms again deluged most of Cuba, southern Florida, and the western Bahamas. Up to 302 mm of rain soaked west-central Cuba as daily totals reached as high as 218 mm. In addition, southern Florida continued experiencing relief from an extended dry spell as most locations measured around 100 mm for the second consecutive week [2 weeks].

3. Hispanola, Puerto Rico, and the Eastern Caribbean Islands:

PRECIPITATION DEFICIT DEVELOPS.

Since mid-March, conditions have been considerably drier than usual. Although reliable data is sparse throughout the region, most regularly reporting stations have measured only 40% to 75% of normal rainfall since early spring, suggesting considerable rainfall shortages throughout the area [8 weeks].

4. Southern Brazil and Eastern Paraguay:

HEAVY LATE-SEASON PRECIPITATION OCCURS.

Normally, precipitation diminishes during the fall and reaches a minimum during the winter months across east-central South America; however, extremely heavy late-season rains (between 150 mm and 325 mm) drenched the region, possibly causing problems for newly planted wheat as. Daily totals reached 159 mm in isolated locations [Episodic Event].

5. The Sahel:

ABNORMAL WARMTH CONTINUES.

Temperatures once again averaged approximately 2°C above normal, prolonging the recent hot spell as temperatures hit 47°C in portions of Mauritania and Senegal [8 weeks].

6. Europe:

SCATTERED LIGHT PRECIPITATION REPORTED.

Scattered light precipitation (20 mm to 35 mm) moistened several parts of the continent, namely eastern Spain, southern France, the central British Isles, Switzerland and Austria, most of the the Germanies and Benelux nations, the northern half of Poland, and southern Scandinavia. Precipitation deficiencies remain significant, however, as most interior locations across the continent (except for the Balkans) have recorded only 25% to 50% of normal precipitation since early May [5 weeks].

7. Eastern India:

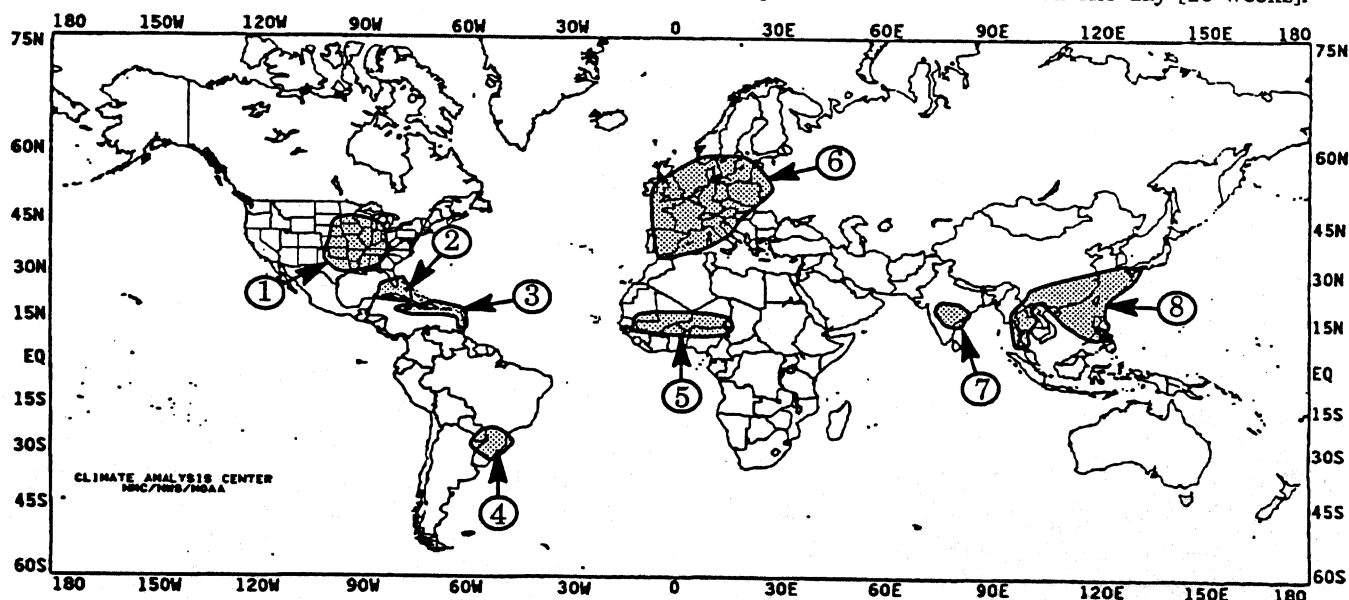
UNSEASONABLY COOL WEATHER CONTINUES.

Weekly departures of -3°C to -6°C again affected central and eastern portions of the nation. Daily departures up to -9°C were observed [5 weeks].

8. Southeastern Asia:

INTENSE RAINFALL DELUGES MANY LOCATIONS.

Only moderate rains fell on southeastern China and Taiwan, although isolated stations reported up to 227 mm and 218 mm, respectively, more than half of which fell from isolated heavy thunderstorms during a single day. Farther west and south, however, intense rainfall continued to drench Thailand and the Philippines. Up to 250 mm inundated Thailand while portions of Luzon, suffering from long-term extreme drought just three weeks ago, recorded up to 367 mm, nearly 200 mm of which fell in one day [10 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.
 MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF MAY 27 THROUGH JUNE 2, 1990.

May's excessively wet and stormy weather showed no signs of abating in June as the first two days of the new month saw devastating tornadoes batter the Texas Panhandle and the Midwest. On Friday night, numerous twisters roared across northern Texas. Damage in the Texas Panhandle town of Spearman was estimated at \$5.5 million. Several injuries and a few fatalities were reported along Farm Road 305 near Iraan, TX. The next day, more than 100 tornadoes touched down in the Midwest, primarily in Indiana and Illinois. The Indiana outbreak was the worst in the state since a tornado barrage in 1974 killed 47 people. A Saturday evening outbreak spawned at least 54 twisters which killed 9 people, injured more than 200, and left 24 deaths in 15 counties with significant damage. The most destructive tornado tore a 5-mile long swath through the southwestern Indiana town of Petersburg, killing 6, injuring 10, and destroying over 150 homes. Petersburg had already been without fresh water for 2 weeks because of flooding that had raised levees along the White River and severed the water supply. In the neighboring states of Illinois and Kentucky, there were 22 and 11 twisters reported, respectively.

As if tornadoes were not enough, copious rains drenched already-saturated south-central Great Plains, the lower Ohio and lower Mississippi Valleys, and parts of the mid-Atlantic. Flash flooding hit parts of Vicksburg, MS with up to 7 inches of rain deluged the area on Thursday. In addition, heavy rains caused extensive flooding in the eastern Ohio, eastern Pennsylvania, and portions of northern Arkansas, southeastern Texas, and northern Louisiana. Welcome rains, however, fell on several normally dry regions. Southern Florida received some relief from its drought as generous rains fell for the second consecutive week (front cover). Additionally, many locations in eastern North Dakota and northern Minnesota, which had not fully recovered from the Drought of 1988, recorded a beneficial 2-3 inches of rain. Meanwhile, unseasonably heavy precipitation (over an inch at San Francisco and Los Angeles) occurred throughout the Far West, easing short-term dryness but providing little relief to California's near drought.

As the week commenced, a strong Pacific cold front entered the West Coast, dropping rain from coastal central California northward to Vancouver Island while snow blanketed the higher elevations of the Sierra Nevadas and Cascades. On Monday, the unseasonably heavy rains pushed even further southward into southern California. Farther east, waves of low pressure propagated eastward along a stationary front that stretched across the south-central Great Plains, the Tennessee Valley, and the mid-Atlantic, producing showers and occasionally severe thunderstorms. The remnants of this year's first Atlantic tropical depression generated heavy showers and thunderstorms in southern Florida.

During the middle of the week, a shot of cool Canadian air over the north-central U.S. converted the stationary front into a rapidly advancing cold front. Along this front, a low pressure center intensified off the Delmarva Peninsula and moved northward up the Atlantic Coast, dumping heavy rains on eastern Pennsylvania, New Jersey, and Long Island.

A Pacific storm system progressed eastward into the Rockies and dissipated, but not before generating scattered showers and thunderstorms in the region. Meanwhile, a second cold front approached the West Coast, and

thunderstorms ahead of a warm front in the south-central Great Plains and lower Mississippi Valley produced 9 twisters and over 60 reports of large hail or damaging winds on Wednesday. The following day, copious thunderstorm rains created flash flooding in parts of eastern Texas, northern Louisiana, and western Mississippi.

Towards the week's end, the second Pacific cold front quickly advanced into the nation's midsection as low pressure rapidly deepened over the northern Great Plains. During Friday evening, severe thunderstorms spawned several tornadoes across northern Texas. By Saturday, the cold front and the area of low pressure had become an unseasonably strong late Spring storm system centered over the upper Great Lakes. The intense system produced a large outbreak of destructive tornadoes across the Ohio and middle Mississippi Valleys. Behind the system, unusually cold and windy weather blasted the northern Plains and upper Midwest. In the West, yet another Pacific storm system approached the coast.

According to the River Forecast Centers, the largest weekly totals (more than 4 inches) were reported once again across portions of the south-central Great Plains and the lower Mississippi Valley, creating additional flooding problems (Figure 1 and Table 1). Elsewhere, heavy precipitation (more than 2 inches) fell on portions of the northern Great Plains and upper Midwest, across the southern and eastern Ohio Valley and the mid-Atlantic, on much of the Carolinas, throughout the southern half of Florida, and at several locations in north-central California, northern Utah, and northern Colorado.

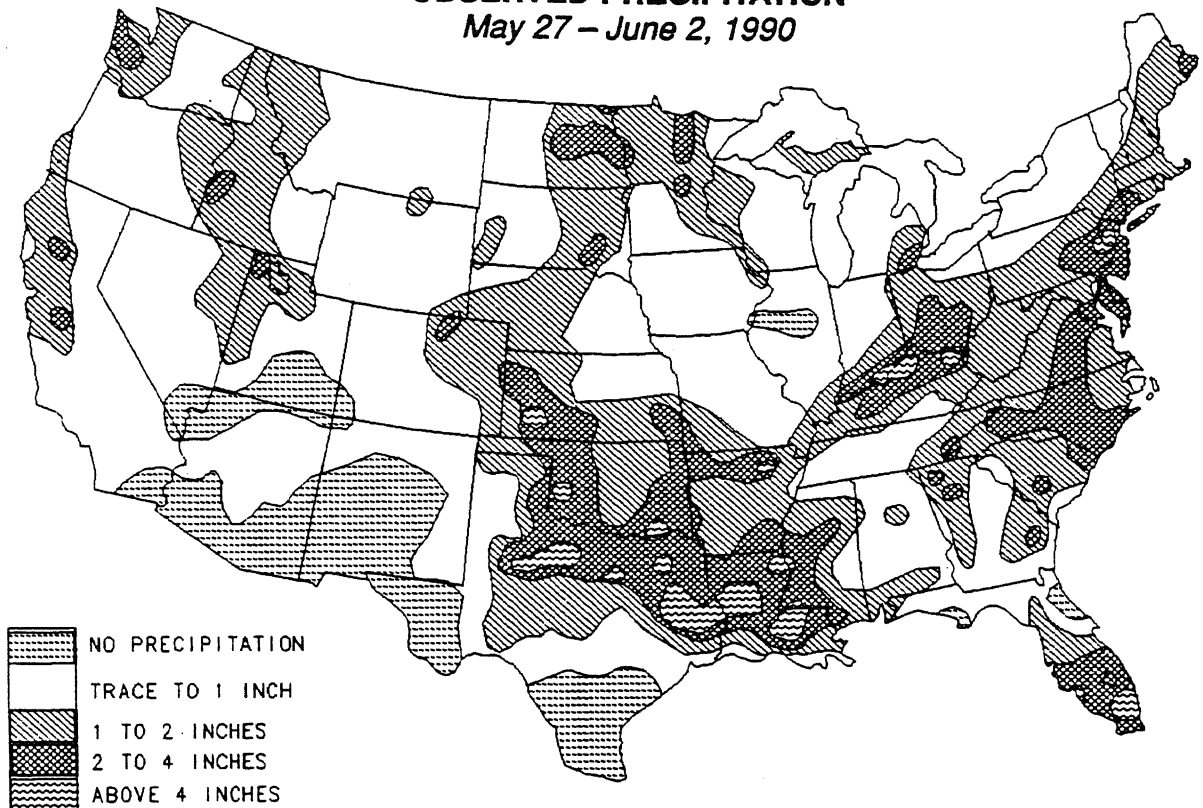
Light to moderate amounts occurred across the remainder of the country with the exception of the southern Intermountain West, the southern Rockies, extreme southern Texas, and parts of the lower Missouri and middle Mississippi Valley, where little or no precipitation was observed. This week's relatively dry weather in the latter two areas aided in the planting of corn and soybeans, although several midwestern states still lagged more than 20% behind average (Figures 3 and 4). Meanwhile, most of Alaska and Hawaii recorded light precipitation.

In addition to this week's widespread precipitation, much of the contiguous U.S. also experienced cooler than normal conditions. Temperatures averaged more than 6°F below normal across much of California and the Great Basin, in parts of the central Great Plains, and the mid-Atlantic (Table 3). Subfreezing readings occurred in the central Rockies, northern and central Intermountain West, and across the upper Great Lakes. Several stations in the Northeast and central Appalachians set new daily record lows during the week as temperatures dropped into the thirties (Figure 2).

In contrast, unseasonably mild weather persisted across Alaska. Above normal temperatures have been observed across the state since early March, with only brief interruptions of cold weather. Many Alaskan locations recorded both weekly departures exceeding +5°F (Table 2) and highs in the seventies. Fairbanks soared to 84°F on June 1 and was in the eighties on 4 other days. In the lower 48 states, only the Pacific Northwest Coast and the extreme northern and southern tier of states east of the Rockies reported above normal temperatures, with the greatest departures (more than +6°F) confined to southern Texas.

OBSERVED PRECIPITATION

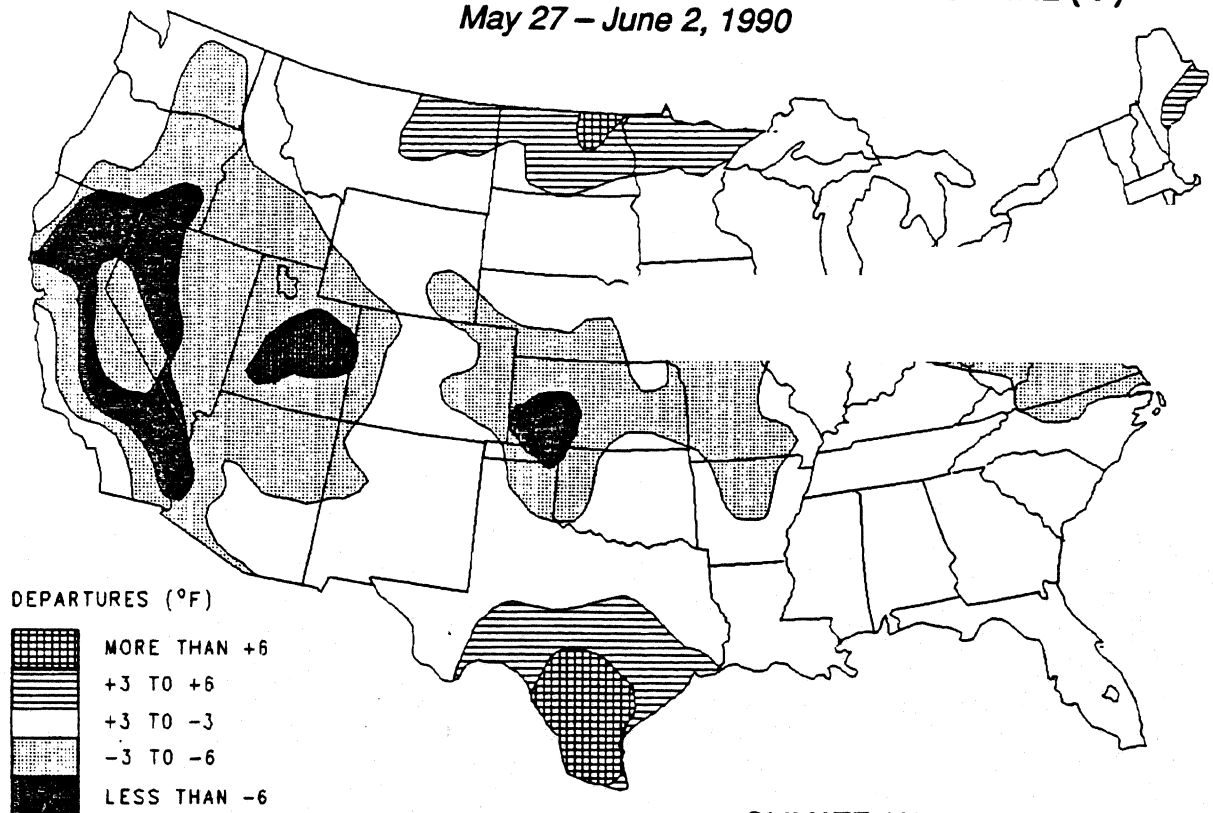
May 27 – June 2, 1990



CLIMATE ANALYSIS CENTER / NOAA

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

May 27 – June 2, 1990



CLIMATE ANALYSIS CENTER / NOAA

TABLE 1. Selected stations with 3.00 or more inches of precipitation for the week.

<u>STATION</u>	<u>TOTAL (INCHES)</u>	<u>STATION</u>	<u>TOTAL (INCHES)</u>
LUFKIN, TX	8.31	MIAMI, FL	3.98
GOLDSBORO/SEYMOUR-JOHNSON AFB, NC	5.51	VERO BEACH, FL	3.74
SHREVEPORT, LA	5.34	WEST PALM BEACH, FL	3.71
LOUISVILLE/STANDIFORD, KY	5.00	FAYETTEVILLE/POPE AFB, NC	3.64
MCCOMB, MS	4.88	MONROE, LA	3.53
GARDEN CITY, KS	4.86	CHARLOTTE, NC	3.37
SHREVEPORT/BARKSDALE AFB, LA	4.50	WICHITA FALLS, TX	3.35
HUNTINGTON, WV	4.43	HOMESTEAD AFB, FL	3.34
MYRTLE BEACH AFB, SC	4.34	BLUE CANYON, CA	3.15
JONESBORO, AR	4.23	FAYETTEVILLE/FORT BRAGG, NC	3.13
ALEXANDRIA/ENGLAND AFB, LA	4.18	HOBART, OK	3.08
KEY WEST, FL	4.12	PATUXENT RIVER NAS, MD	3.01
FORT MYERS, FL	4.10		

TABLE 2. Selected stations with temperatures averaging 5.0°F or more ABOVE normal for the week.

<u>STATION</u>	<u>DEPARTURE (°F)</u>	<u>AVERAGE (°F)</u>	<u>STATION</u>	<u>DEPARTURE (°F)</u>	<u>AVERAGE (°F)</u>
NOME, AK	+13.9	55.4	KOTZEBUE, AK	+6.7	45.0
FAIRBANKS, AK	+13.3	67.9	AUSTIN, TX	+6.4	84.5
BETTLES, AK	+12.9	65.6	CORDOVA/MILE 13, AK	+6.2	52.9
BETHEL, AK	+11.3	57.6	VICTORIA, TX	+6.0	85.0
BIG DELTA, AK	+10.8	63.3	BROWNSVILLE, TX	+5.8	86.6
NORTHWAY, AK	+9.7	59.7	ANNETTE ISLAND, AK	+5.4	56.8
MCGRATH, AK	+9.5	60.1	KING SALMON, AK	+5.4	51.8
YAKUTAT, AK	+8.5	54.5	BARROW, AK	+5.3	32.3
TALKEETNA, AK	+8.1	57.8	EASTPORT, ME	+5.2	58.4
SAN ANTONIO, TX	+7.6	86.1	VALDEZ, AK	+5.2	52.9
KINGSVILLE NAS, TX	+7.3	87.8	CORPUS CHRISTI, TX	+5.1	85.0
JUNEAU, AK	+7.3	56.9	GLASGOW, MT	+5.1	64.4
SITKA, AK	+7.3	55.2			

TABLE 3. Selected stations with temperatures averaging 6.0°F or more BELOW normal for the week.

<u>STATION</u>	<u>DEPARTURE (°F)</u>	<u>AVERAGE (°F)</u>	<u>STATION</u>	<u>DEPARTURE (°F)</u>	<u>AVERAGE (°F)</u>
REDDING, CA	-11.6	60.9	HAMPTON/LANGLEY AFB, VA	-6.4	63.6
BLUE CANYON, CA	-11.3	44.0	TONOPAH, NV	-6.2	55.2
RED BLUFF, CA	-10.2	61.3	STOCKTON, CA	-6.2	62.9
SEXTON SUMMIT, OR	-9.0	43.2	PATUXENT RIVER NAS, MD	-6.2	63.6
BLYTHE, CA	-7.8	75.6	MARTINSBURG, WV	-6.1	60.2
BAKERSFIELD, CA	-7.7	66.4	DODGE CITY, KS	-6.1	63.1
LOVELOCK, NV	-7.4	54.8	WASHINGTON/NATIONAL, DC	-6.1	64.1
DAGGETT, CA	-7.3	69.6	BURNS, OR	-6.0	49.9
FRESNO, CA	-6.6	64.6	WINNEMUCCA, NV	-6.0	52.8
OGDEN/HILL AFB, UT	-6.4	55.4	DANVILLE, VA	-6.0	65.8

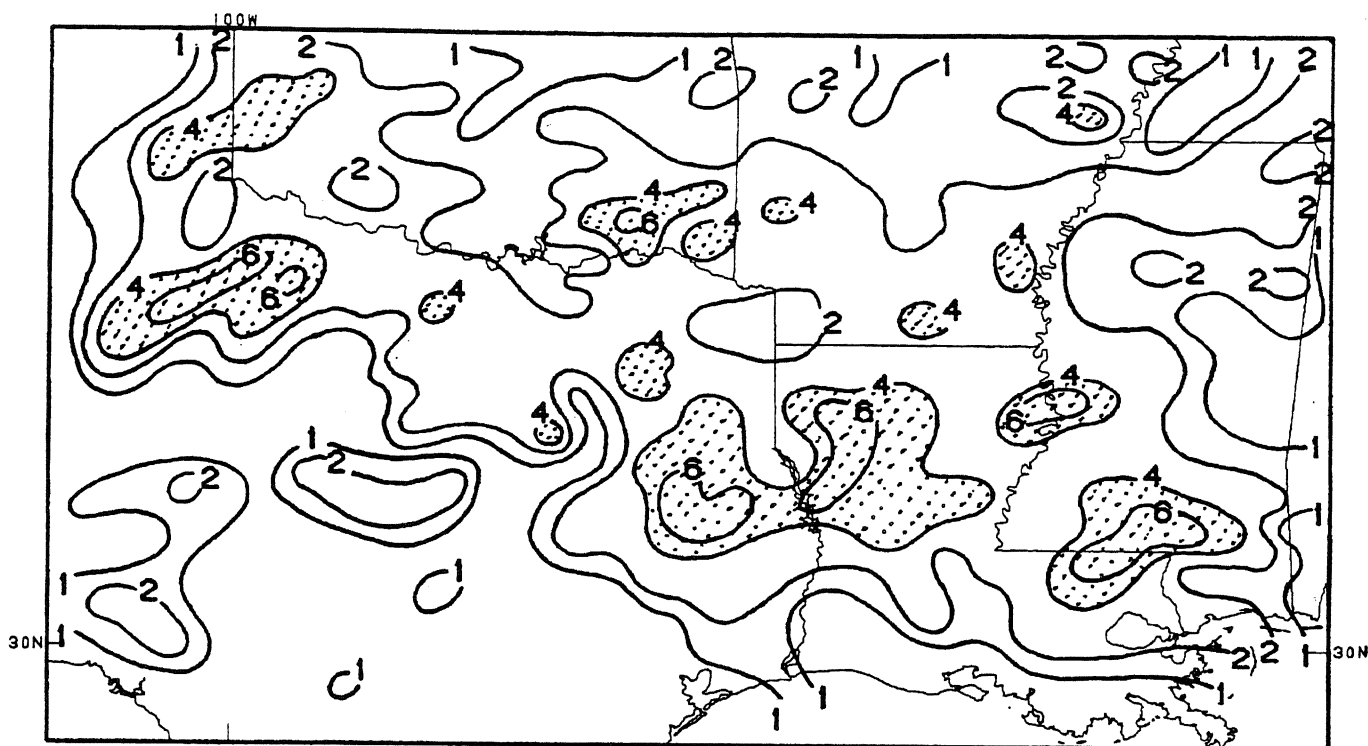
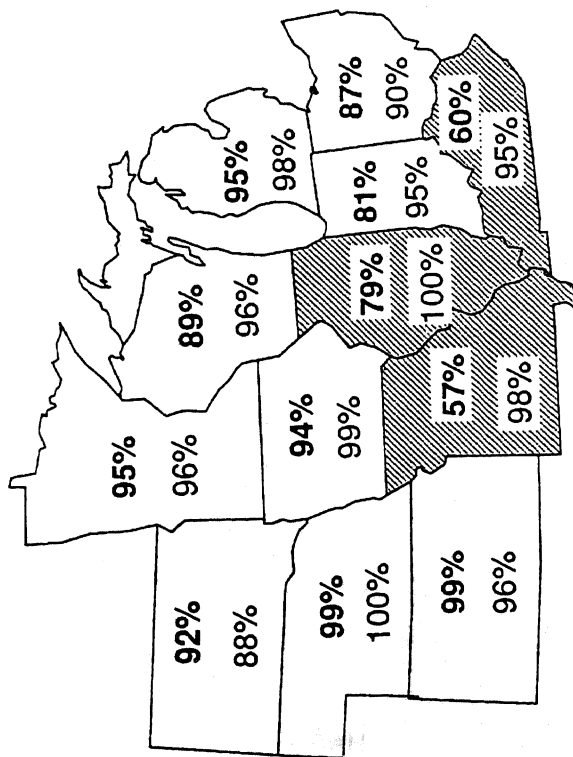


Figure 1. Total precipitation (inches) during May 27-June 2, 1990 based upon first-order synoptic, airways, and the River Forecast Centers stations. Once again, heavy rains inundated portions of the south-central Great Plains and the lower Mississippi Valley, producing new or aggravating previous flooding problems. In addition, several tornadoes accompanied these thunderstorms, particularly in the Texas Panhandle, while over a hundred twisters devastated areas farther north (e.g. Indiana, Illinois, and Kentucky).

CORN PLANTING PROGRESS

Week Ending June 3, 1990



Bold text is this year's planting progress.

Normal text is average planting progress.

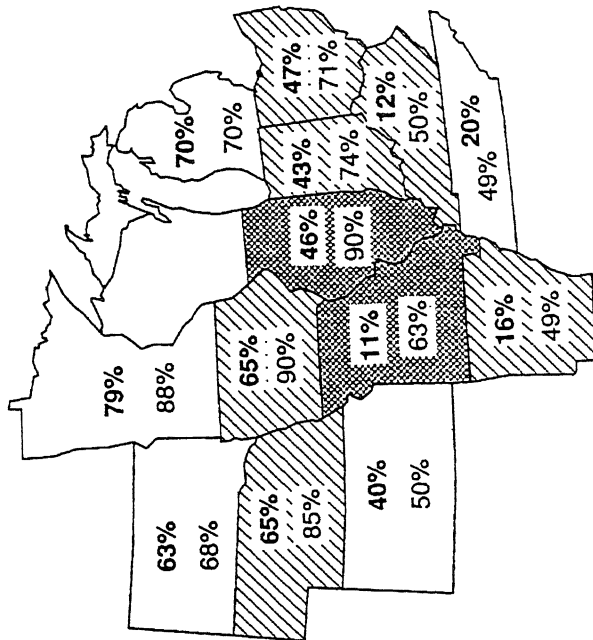
Shaded states are 20% or more behind average.

Figure 3. Corn planting progress as of June 3, 1990, obtained from the USDA/National Agricultural Statistics Service. Top (**bold**) value indicates this year's planting progress, and bottom (normal) value indicates the average planting progress. Shaded states are more than 20% behind the average planting progress. Relatively dry weather in northern Missouri, southern Iowa, and most of Illinois aided corn planting, but progress is still well behind in MO, IL, KY, and IN.

Figure 4. Soybean planting progress as of June 3, 1990, obtained from the USDA/National Agricultural Statistics Service. Top (**bold**) value indicates this year's planting progress, and bottom (normal) value indicates the average planting progress. Hatched states are 20-40% behind the average planting progress, and the double-hatched states are more than 40% behind the average planting progress. Last week's dry weather helped soybean plantings somewhat, but much of the middle Mississippi and western Ohio Valleys were still way behind the average planting progress.

SOYBEAN PLANTING PROGRESS

Week Ending June 3, 1990



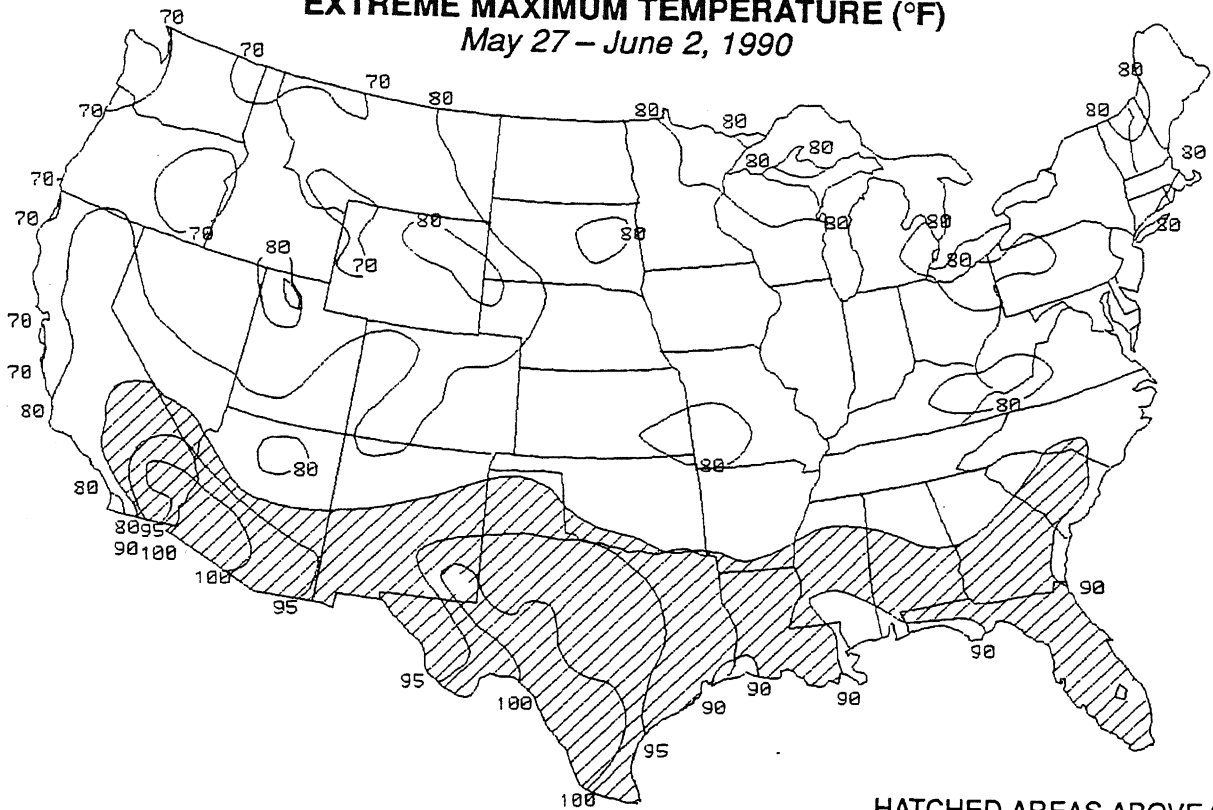
Bold text is this year's planting progress.

Normal text is average planting progress.

Hatched states are 20% or more behind average.

Cross-hatched states are 40% or more behind average.

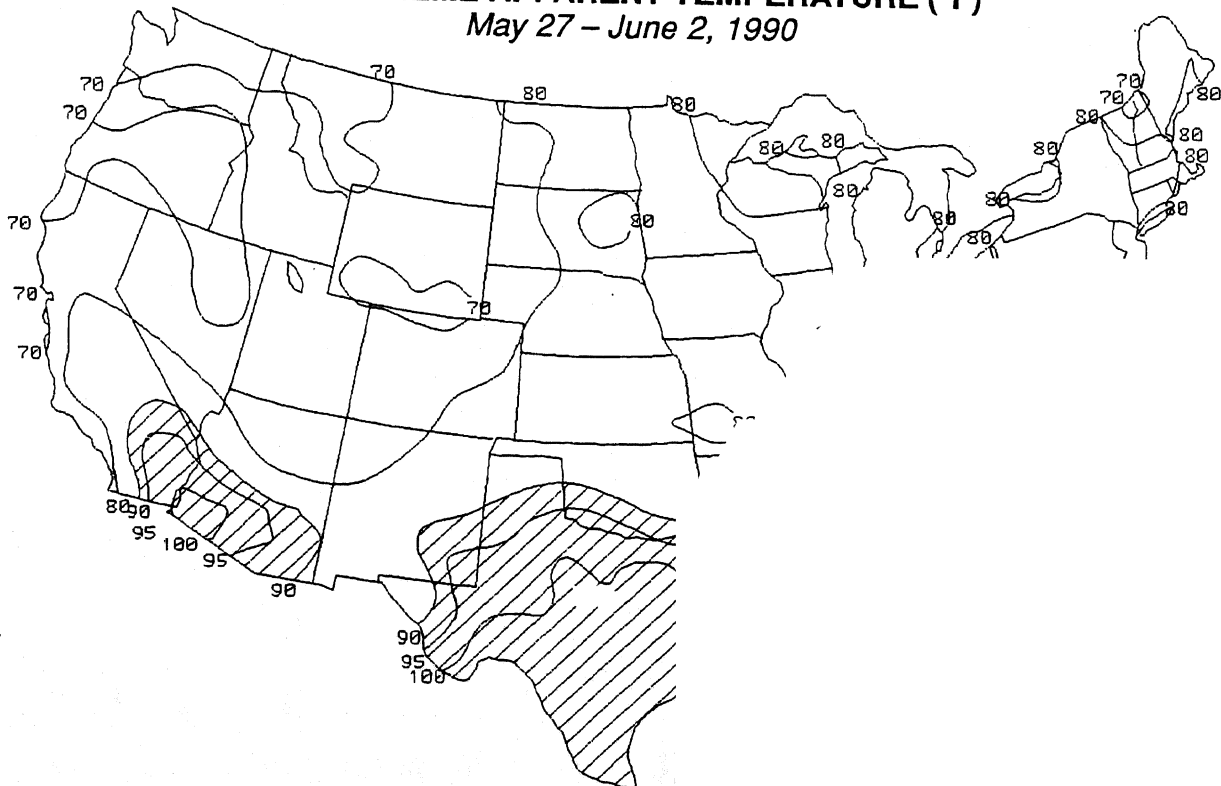
EXTREME MAXIMUM TEMPERATURE (°F)
May 27 – June 2, 1990



HATCHED AREAS ABOVE 90°F

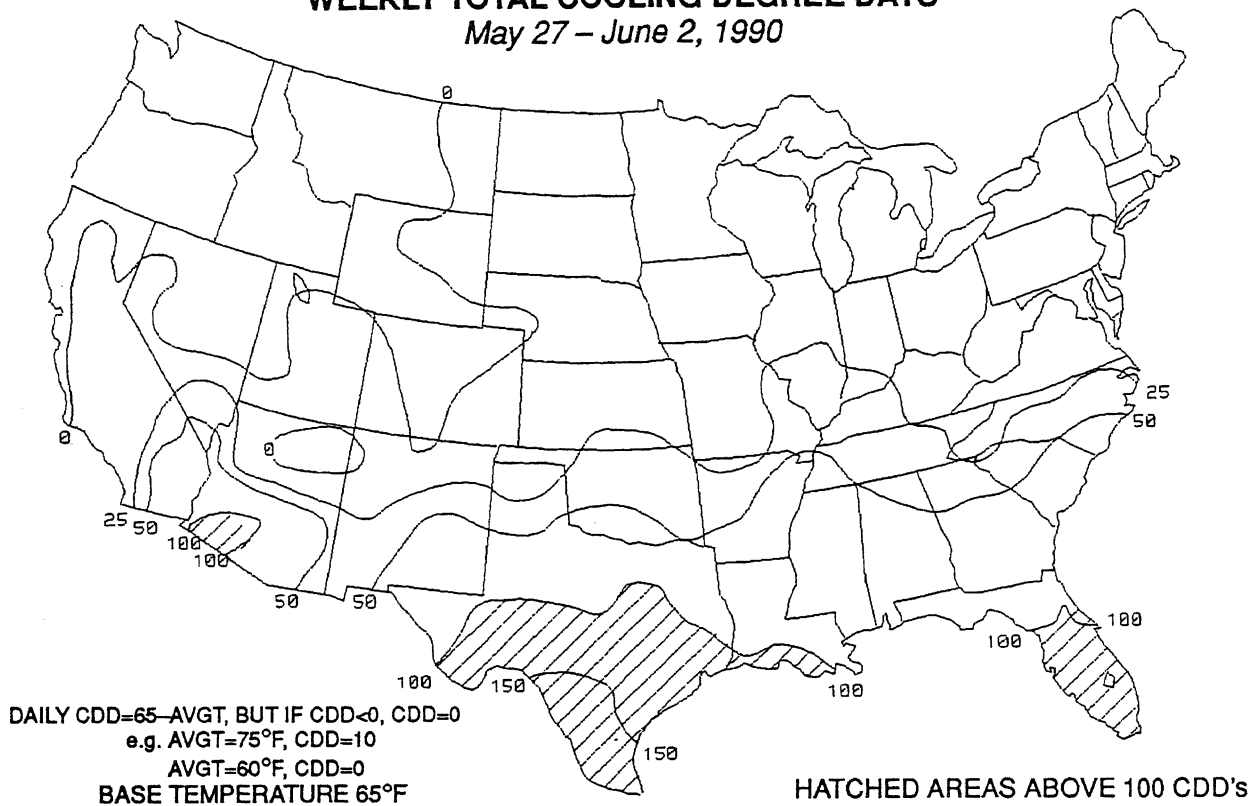
Triple-digit temperatures seared portions of the southwestern Great Plains as well as the Desert Southwest (top) while high humidities generated apparent temperatures above 100°F in parts of Florida and the lower Mississippi Valley, and brought discomfort into portions of the middle Mississippi and Tennessee Valleys as well as the southern half of Illinois (bottom).

EXTREME APPARENT TEMPERATURE (°F)
May 27 – June 2, 1990



WEEKLY TOTAL COOLING DEGREE DAYS

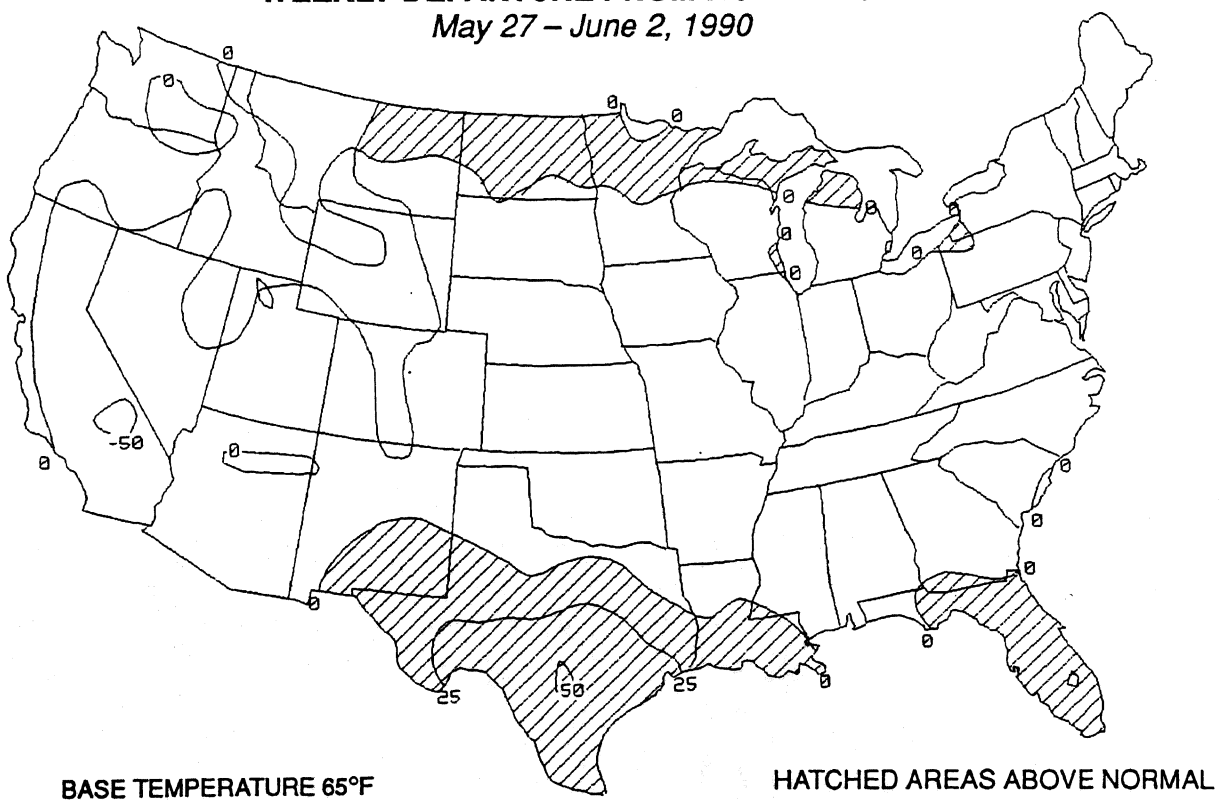
May 27 - June 2, 1990



Warm weather was confined to the southern tier of states, restricting significant heating usage to Florida, the southern Plains, and the southwestern Deserts (top), and limiting heavier than usual heating demand to the southern half of Texas (bottom).

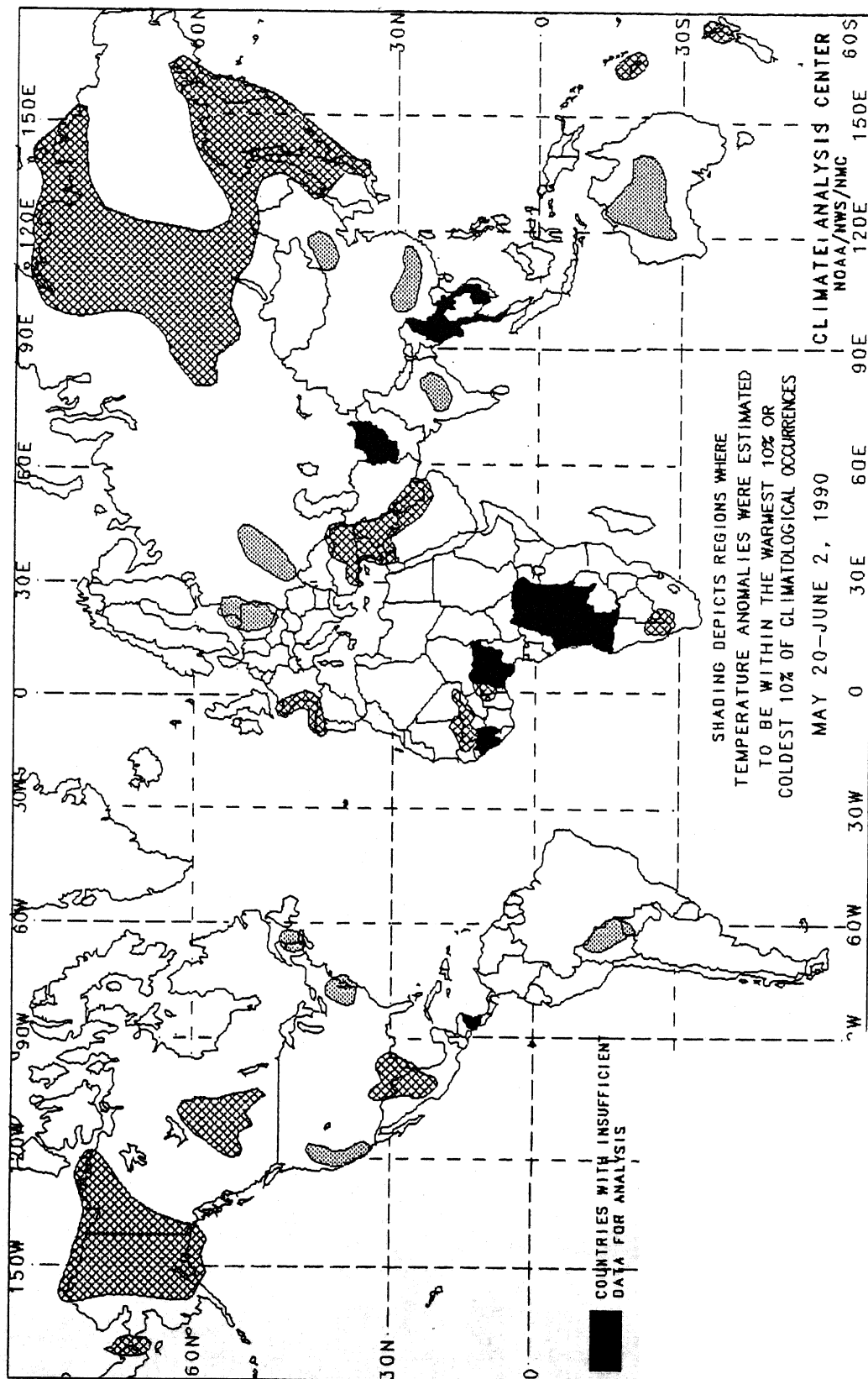
WEEKLY DEPARTURE FROM NORMAL CDD

May 27 - June 2, 1990



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



In approximately 2500 temperature observations, stations do not operate on a minimum temperature in an overestimation

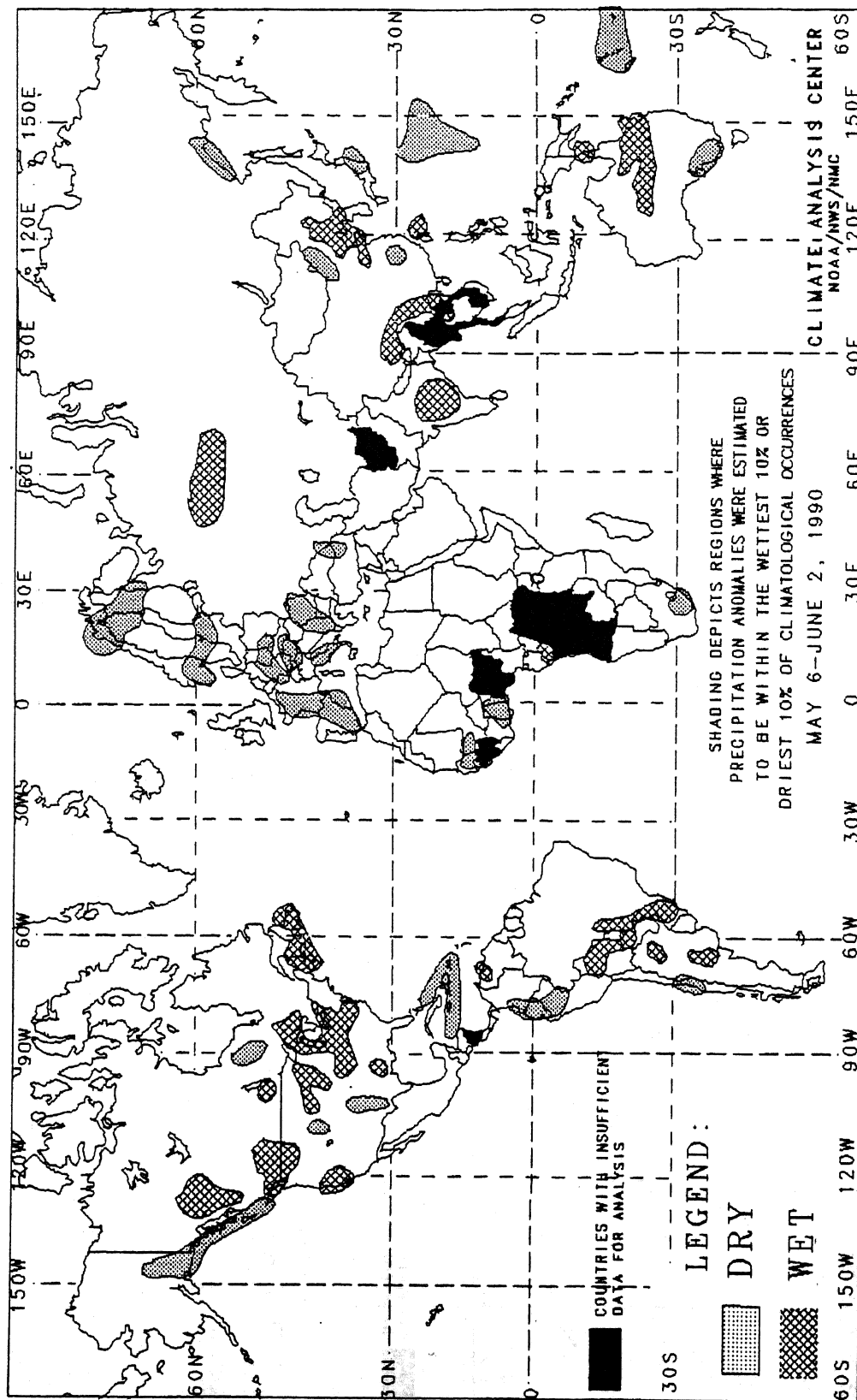
less the magnitude of

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

CORRECTION: The track of Typhoon Marian was incorrectly depicted in the Weekly Climate Bulletin #90/20 (dated May 19) on the Global Climate Highlights page and in the text on the front cover, which described how Marian "brushed by the eastern coast of the Philippines." The correct track is shown below.

